

## Integrated Solar-Panel Antenna Array for CubeSats (ISAAC)

Completed Technology Project (2015 - 2017)



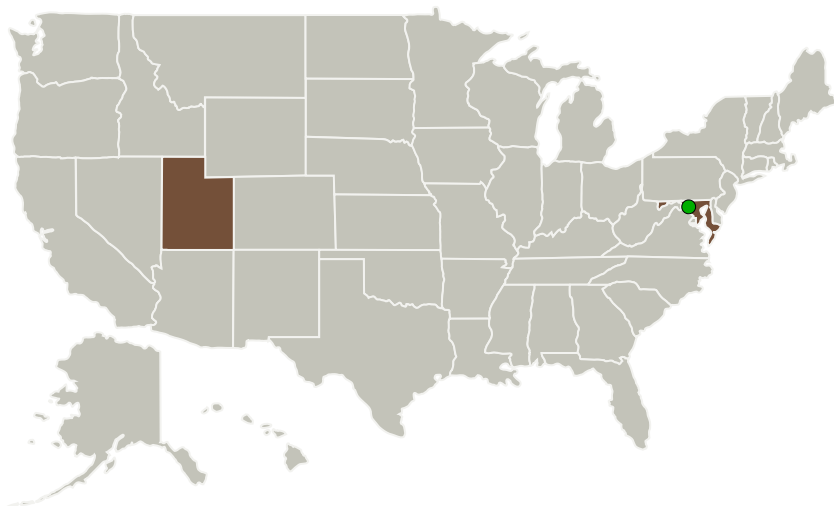
## Project Introduction

This project will develop a new subsystem technology for CubeSats. Integrated Solar-Panel Antenna Array for CubeSats (ISAAC) is an efficient, compact, high gain, low power consumption, lightweight, small volume, X-band antenna array with circularly-polarized radiation to support high data rate downlink. The antenna design is optically transparent (i.e. will not compete for valuable surface real estate), modular, and is independent from the solar cells.

## Anticipated Benefits

Today's CubeSat system uses either UHF or S-band communication systems with only up to 3 Mbps downlink. With the proposed X-band antenna, the downlink bit rate will be enhanced to 50 Mbps with reasonable modulation and coding. Due to its high performance, ISAAC will play a key role in the link budget and relaxes dependency on complex ground stations, which will consequently reduce the cost of science mission.

## Primary U.S. Work Locations and Key Partners



Integrated Solar-Panel Antenna Array for CubeSats

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Utah State University (USU)

**Responsible Program:**

Small Spacecraft Technology

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Organizations Performing Work	Role	Type	Location
Utah State University(USU)	Lead Organization	Academia Alaska Native and Native Hawaiian Serving Institutions (ANNH)	Logan, Utah
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Maryland	Utah
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## Project Transitions

▶ **October 2015:** Project Start

✓ **October 2017:** Closed out

**Closeout Summary:** ISAAC successfully completed antenna design, inkjet printing of the antenna on glass, assembling 6U solar panel, and performing all performance tests on antennas and solar panel in the lab environment. Test results confirm a 95% transparency reflectarray with more than 22 dB gain. Pursuing future CubeSat flight demonstration

## Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

## Project Management

**Program Director:**

Christopher E Baker

**Program Manager:**

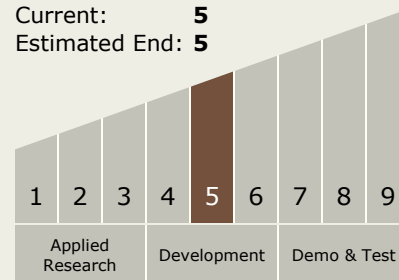
Roger Hunter

**Principal Investigator:**

Reyhan Baktur

## Technology Maturity (TRL)

Start: **5**  
Current: **5**  
Estimated End: **5**



## Target Destination

Earth